

**ABSTRACT OF THE DISCLOSURE**

In general, the present invention is directed to methods of using weight or mass measurements to control various semiconductor manufacturing processes, and systems for accomplishing same. One illustrative method comprises providing a substrate, performing a deposition process to form a process layer above the substrate, determining a weight or mass of the process layer formed above the substrate, and controlling at least one parameter of the deposition process based upon the determined weight or mass of the process layer. One illustrative system in accordance with the present invention comprises a deposition tool for performing a deposition process to form a process layer above a substrate, a pressure sensor in contact with the substrate for sensing a pressure induced as a result of the process layer formed above the substrate, and a controller for controlling at least one parameter of the deposition process based upon the sensed pressure. The method and systems disclosed herein may also be used with other processes, such as etching processes.